



# Riverton, Wyoming, Processing Site

## FACT SHEET

*This fact sheet provides information about the Uranium Mill Tailings Radiation Control Act of 1978 Title I processing site at Riverton, Wyoming. This site is managed by the U.S. Department of Energy Office of Legacy Management.*

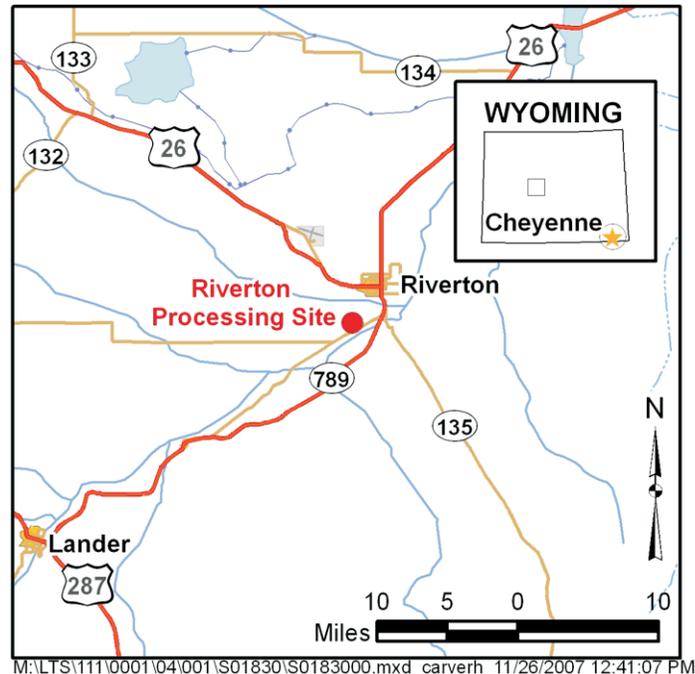
### Site Description and History

The former Riverton, Wyoming, Processing Site is in Fremont County, 2 miles southwest of the town of Riverton and within the boundaries of the Wind River Indian Reservation (Northern Arapaho and Eastern Shoshone) on land now owned by the State of Wyoming. The site is the location of a former uranium- and vanadium-ore processing mill that operated from 1958 to 1963. Past milling operations created radioactive mill tailings, a predominantly sandy material, and uranium, radium, and thorium contamination in soils and construction debris. The tailings pile covered about 72 acres of the 140-acre site to an average depth of 4 feet. In 1988, about 1.8 million cubic yards of the contaminated materials were removed from the site and relocated to the Gas Hills East Disposal Site 45 miles away. The U.S. Department of Energy (DOE) completed surface remediation of the Riverton site in 1989.

Milling operations at the site caused both surface and ground water contamination. Three aquifers underlie the site: an unconfined surficial aquifer, an underlying semiconfined sandstone aquifer, and a deeper confined sandstone aquifer. Only ground water in the surficial aquifer has been contaminated by ore-processing operations at the site.

### Regulatory Setting

Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) in 1978 (Public Law 95-604) and DOE remediated 22 inactive uranium ore-processing sites under the Uranium Mill Tailings Remedial Action Project in accordance with standards promulgated by the U.S. Environmental Protection Agency in Title 40 *Code of Federal Regulations* (CFR) Part 192. Subpart B of 40 CFR 192 regulated cleanup of contaminated ground water at the processing sites. The radioactive materials were encapsulated in U.S. Nuclear Regulatory Commission-approved disposal cells. The U.S. Nuclear Regulatory Commission general license for UMTRCA Title I sites is established in 10 CFR 40.27.



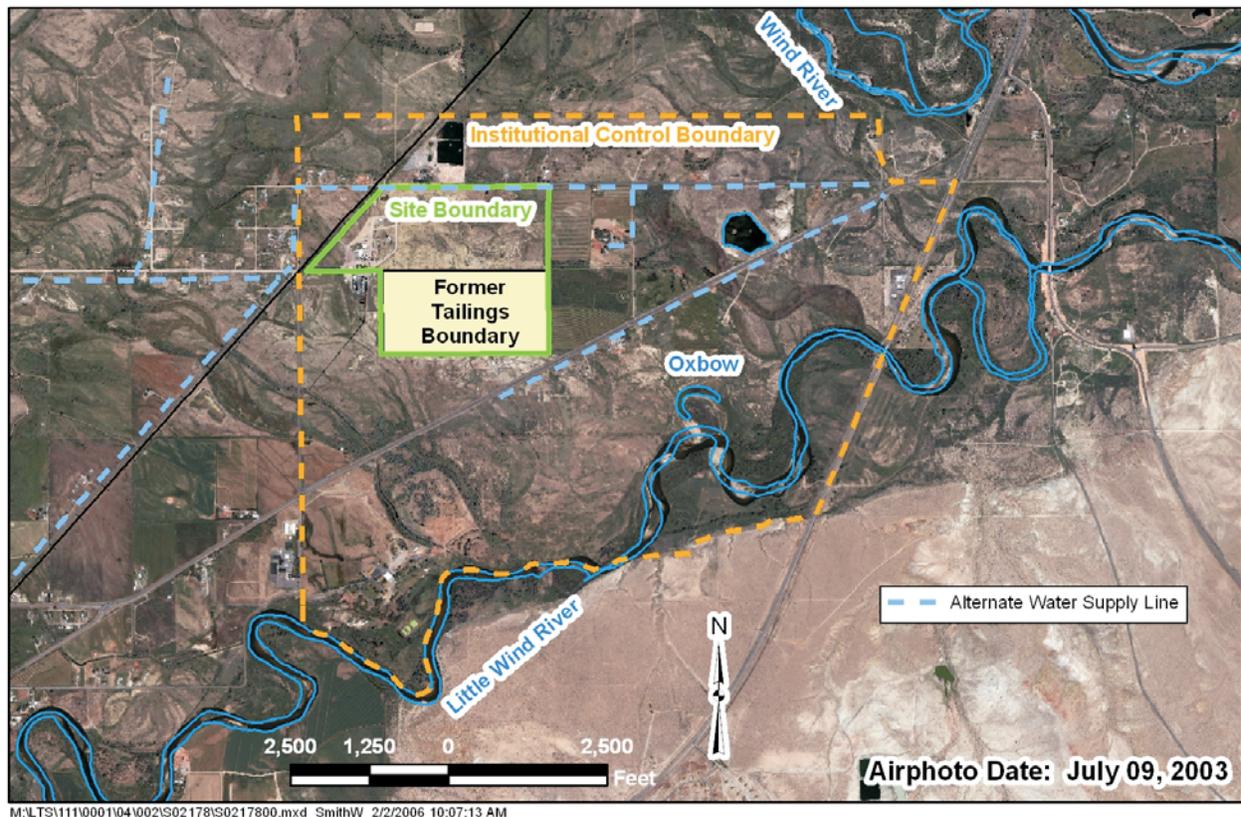
*Location of the Riverton Processing Site*

### Processing Site

The site is on alluvial deposits between the Wind River, 1 mile north, and the Little Wind River, about 3,200 feet south.

The surficial aquifer consists of 15 to 20 feet of alluvial sand and gravel; depth to ground water typically ranges from 3 to 6 feet below ground surface. Ground water flow is generally to the southeast toward the Little Wind River. Concentrations of milling-related molybdenum and uranium measured in samples from the surficial aquifer have been 10 to 40 times greater than their respective maximum concentration limits in 40 CFR 192.

The semiconfined aquifer consists of sandstone 15 to 30 feet thick and is continuous throughout the Riverton site. A layer of shale 5 to 10 feet thick partially



*Institutional Control Boundary, Site Boundary, Former Tailings Boundary, and Alternate Water Supply Lines at the Riverton Processing Site*

separates the surficial and semiconfined aquifers. Concentrations of molybdenum and uranium in the semiconfined aquifer typically have been low and within the range of background concentrations.

### **Compliance Strategy**

The ground water compliance strategy for the Riverton site is natural flushing in conjunction with institutional controls and monitoring. Ground water modeling predicts that site-related molybdenum and uranium in the surficial aquifer will flush naturally to levels below their maximum concentration limits within the 100-year time frame allowed in 40 CFR 192. DOE will collect samples semiannually at ground water and surface water monitoring locations to track the progress of natural flushing and to verify that contaminant concentrations are decreasing as predicted.

Although contaminated ground water is assumed to discharge to the Little Wind River, ground water contaminants have had no measurable effect on river water quality. An oxbow lake formed by a shift in the river path in 1994 receives inflow from contaminated ground water, and concentrations of uranium in the oxbow are elevated but variable. The variability is attributed to inflow from the river during high river stage, which causes dilution of uranium concentrations.

### **Institutional Controls**

Institutional controls at the Riverton site consist of three components: (1) an alternate drinking water supply system (in place), (2) restrictions on new wells and land use, and (3) a deed restriction on state-owned property at the site (in progress).

DOE is working with the Arapaho and Shoshone Tribes and the State of Wyoming to obtain enforceable institutional controls at the site. DOE funded an alternate drinking water supply system in 1998 to provide potable water to residents within the institutional controls boundary. However, elevated concentrations of radionuclides were detected in the system in 2002 and were confirmed in samples collected in May 2004. In response to elevated concentrations of radionuclides in the system, DOE conducted a 2-year flushing and monitoring program. Results of the flushing and monitoring program prove that a unidirectional flushing program is effective in controlling radionuclide build-up within the system. A perpetual deed restriction is being developed for the former millsite property owned by the state that will restrict land development and prohibit well drilling.

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## Legacy Management Activities

DOE will manage the Riverton Processing Site according to a site-specific Long-Term Management Plan that is currently being developed. Monitoring during the natural flushing period is referred to as verification monitoring because its purpose is to verify that the strategy is progressing as predicted and that institutional controls are in place and functioning as intended. DOE will collect ground water and surface water samples semiannually once in June when the water table and river flow are typically highest and once in October when the water table and river flow are typically lowest. Data from these sampling events will be used to assess variations in contaminant concentrations attributable to seasonal fluctuations and to track contaminant concentrations over time.

## Contacts

Documents related to the Riverton Processing Site are available on the DOE Office of Legacy Management website at <http://www.LM.doe.gov/land/sites/wy/riverton/riverton.htm>.

For more information about DOE Office of Legacy Management activities at the Riverton Processing Site, contact

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